



# 材料安全数据表

## Material Safety Data Sheet

样品名称: 锂离子电池

Name of Sample: Rechargeable Li-ion Battery Pack

委托单位: OPAL ENERGY PTE LTD

Commissioner: OPAL ENERGY PTE LTD

英格尔检测技术服务(上海)有限公司

ICAS Testing Technology Service (Shanghai) Co., Ltd.





材料安全数据表  
Material Safety Data Sheet

Section 1. 产品名称及企业标识

CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

样品名称 Name of goods	锂离子电池 Rechargeable Li-ion Battery Pack
样品型号 Type/Mode	OPAL-48100LV-ES
额定电压 Rated voltage	48V
额定容量 Rated capacity	100Ah
生产单位 Manufacturer	翠鸟新能源科技（南通）有限公司 Kingfisher New Energy Technology (Nantong) Co., Ltd.
生产单位地址 Manufacturer address	江苏省南通市海安市海安镇西园大道 89 号 No.89, Xiyuan Avenue, Hai'an town, Hai'an City, Nantong City, Jiangsu Province, China
应急电话 Emergency telephone call	+65-6515-4780
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**Section 2. 成分/组成信息**

**COMPOSITION INFORMATION**

化学成分 Chemical Composition	化学式 Chemical Formula	CAS 号 CAS No.	重量百分比(约) Weight (%)(About)
石墨Graphite	C	7782-42-5	7-25
磷酸铁锂Lithium iron Phosphate	LiFePO <sub>4</sub>	15365-14-7	15-40
偏氟乙烯, 六氟丙烯共聚物 Hexafluoropropylene-vinylidene fluoride Copolymer	C <sub>5</sub> H <sub>2</sub> F <sub>8</sub>	9011-17-0	3-15
六氟磷酸锂Lithium Hexafluorophosphate	LiPF <sub>6</sub>	21324-40-3	0-5
乙炔炭黑Acetylene Black	C	1333-86-4	0-2
碳酸二乙酯Diethyl Carbonate	C <sub>5</sub> H <sub>10</sub> O <sub>3</sub>	105-58-8	0-15
碳酸二甲酯Dimethyl Carbonate	C <sub>3</sub> H <sub>6</sub> O <sub>3</sub>	616-38-6	0-15
碳酸甲乙酯Ethyl Methyl Carbonate	C <sub>4</sub> H <sub>8</sub> O <sub>3</sub>	623-53-0	0-15
碳酸丙烯酯Propylene Carbonate	C <sub>4</sub> H <sub>6</sub> O <sub>3</sub>	108-32-7	0-15
碳酸亚乙酯Ethylene Carbonate	C <sub>3</sub> H <sub>4</sub> O <sub>3</sub>	96-49-1	0-15
铜Copper	Cu	7440-50-8	5-15
铁Iron	Fe	7439-89-6	15-25
铝Aluminium	Al	7429-90-5	1-5
铅Lead	Pb	7439-92-1	无 Note Detected
镉Cadmium	Cd	7440-43-9	无 Note Detected
汞Mercury	Hg	7439-97-6	无 Note Detected

**Section 3. 危险性概述**

**Hazards Identification**

爆炸危险性 Explosive risk	该物品不属于爆炸危险品 This article does not belong to the explosion dangerous goods
易燃危险性 Flammable risk	该物品不属于易燃危险品 This article does not belong to the flammable material
氧化危险性 Oxidation risk	该物品不属于氧化危险品 This article does not belong to the oxidation of dangerous goods
毒害危险性 Toxic risk	该物品不属于毒害危险品 This article does not belong to the toxic dangerous goods
放射危险性	该物品不属于放射危险品





Radioactive risk	This article does not belong to the radiation of dangerous goods
腐蚀危险性 Mordant risk	该物品不属于腐蚀危险品 This article does not belong to the corrosion of dangerous goods
其他危险性 other risk	该产品属于磷酸铁锂电池组,瓦时率 4800Wh, 属于 IMDG CODE 和 IATA DGR 中的第九类危险品 The product belongs to lithium iron phosphate battery pack, Watt hour rate 4800Wh, which belong to the miscellaneous dangerous goods, as is described in IMDG CODE and IATA DGR.

#### Section 4. 急救措施

##### First aid measures

食入：引用两杯牛奶或水。如果当事人仍然清晰可以采取催吐的方法，并且立即就医。  
Ingestion: Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician

吸入：立即从暴露处移至空气清新处，如果呼吸困难给予输氧，立即就医。  
Inhalation: Remove from exposure and move to fresh air immediately. Use oxygen if available.

眼睛：万一接触，立即用大量的清水冲洗至少 15 分钟，翻起上下眼睑，直到化学的残留物消失为止，迅速就医。  
Eye: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

皮肤：万一接触，用大量水冲洗至少 15 分钟，同时除去污染的衣物和鞋子，迅速就医。  
Skin: Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.

#### Section 5. 消防措施

##### Fire-fighting measures

燃点：不适用  
Flash Point: N/A.

自燃温度：不适用  
Auto-Ignition Temperature: N/A.

灭火介质：大量水（降温），二氧化碳  
Extinguishing Media : Water, CO<sub>2</sub>.

特殊灭火程序：自给式呼吸器  
Special Fire-Fighting Procedures: Self-contained breathing apparatus.



异常火灾或爆炸：当电芯暴露于过热的环境中时，安全阀可能会打开。

Unusual Fire and Explosion Hazards: Cell may vent when subjected to excessive heat-exposing battery contents.

燃烧产生的危险物品：一氧化碳，二氧化碳，锂氧化物烟气

Hazardous Combustion Products: Carbon monoxide, carbon dioxide, lithium oxide fumes.

## Section 6. 泄露应急处理

### Accidental release measures

为防止电池材料泄漏或释放采取的措施

Steps to be taken in case Material is Released or Spilled

如果电池内部材料泄漏，试验人员应立刻撤离试验区直到烟气消散。将通风设备打开吹散危险性气体。用抹布擦净试验区，清除溢出的液体，将泄漏电池放进塑料袋中，然后放进钢制容器。避免皮肤和眼睛接触或吸入有害气体。

If the battery material is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. Wipe it up with a cloth, and dispose of it in a plastic bag and put into a steel can. The preferred response is to leave the area and allow the battery to cool and vapors to dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate.

废弃物处置方法

Waste Disposal Method

电池的循环寿命是有限的，当充满电后使用时间比较短时需要更换新的电池。

Despite being rechargeable, the battery has a limited life span, Replace when usage time between charges becomes short.

废弃电池请安全妥当处理，不要投入火中或液体中。

Please waste batteries properly deal with security, do not put in fire or liquids.

## Section 7. 操作处置和储存

### Handling and storage

禁止打开、毁坏或焚烧电池，因为电池有可能在这些处理过程中发生爆炸、破裂或泄露等事故。

禁止将电池短路、过充、强制放电或扔入火中。禁止挤压刺穿电池或将电池浸入溶液中。

The battery should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container.

Do not short circuit terminals, or over charge the battery, forced over-discharge, throw to fire.

Do not crush or puncture the battery, or immerse in liquids.



操作处置和储存中的防范措施

Precautions to be taken in handling and storing

禁止物理或电滥用，禁止高温储存，最好将电池储存在阴凉、干燥、通风等温度变化较小的环境中。禁止将电池接触加热设备或将电池直接暴露与阳光中。

Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subject to little temperature change. Storage at high temperatures should be avoided. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods.

其他要注意的防范措施

Other Precautions

拆解、挤压、直接放入火中或高温条件下，电池可能发生爆炸和燃烧。禁止短接或将电池正负极错误的安装在设备中。

The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

**Section 8. 接触控制/个人防护**

**Exposure controls/personal protection**

呼吸防护：当电池排气阀打开时，应尽量使通风设备开至最大，避免将打开排气阀的电芯局限在某一狭窄空间内。正常操作条件下，呼吸保护是不必要的。

Respiratory Protection: In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting cell cores. Respiratory Protection is not necessary under conditions of normal use.

通风条件:正常使用条件下不需要。

Ventilation: Not necessary under conditions of normal use.

防护手套:正常使用条件下不需要。

Protective Gloves: Not necessary under conditions of normal use.

其他防护服装或设备:正常使用条件下不需要。

Other Protective Clothing or Equipment: Not necessary under conditions of normal use.

电池开阀试验时应做好个人防护:呼吸防护，防护手套，防护服装和有护边的安全玻璃罩都是要准备的。

Personal Protection is recommended for venting battery: Respiratory Protection, Protective Gloves, Protective Clothing and safety glass with side shields.





## Section 9. 理学特性

### Physical and chemical properties

外形: 方形

Appearance: Quadrate shape

气味: 泄漏时, 有醚的气味。

Odour: If leaking, smells of medical ether.

酸碱度: 不适用

pH: Not applicable as supplied.

燃点: 除单个电芯暴露试验外其他不适用。

Flash Point: Not applicable unless individual components exposed.

可燃性: 除单个电芯暴露试验外其他不适用。

Flammability: Not applicable unless individual components exposed.

相对密度: 除单个电芯暴露试验外其他不适用。

Relative density: Not applicable unless individual components exposed

溶解性 (水溶性): 除单个电芯暴露试验外其他不适用。

Solubility (water): Not applicable unless individual components exposed

溶解性 (其他): 除单个电芯暴露试验外其他不适用。

Solubility (other): Not applicable unless individual components exposed

## Section 10. 稳定性和反应活性

### Stability and reactivity

稳定性: 产品在第7节所述的条件下稳定。

Stability: Product is stable under conditions described in Section 7.

应避免的条件: 加热 70°C 以上或焚烧、变形、毁坏、粉碎、拆卸、过充电、短路或长时间暴露在潮湿的条件下。

Conditions to Avoid: Heat above 70°C or incinerate、deform、mutilate、crush、disassemble、overcharge、short circuit or expose over a long period to humid conditions.

应避免的材料: 氧化剂, 碱, 水。

Materials to avoid: Oxidizing agents, alkalis, water.



危险分解物：有毒烟雾，并可能形成过氧化物。

Hazardous Decomposition Products: Toxic Fumes, and may form peroxides.

聚合危害：不适用

Hazardous Polymerization: N/A.

如果发生泄露，避免与强氧化剂、无机酸、强碱或卤代烃接触。

If leaked, forbidden to contact with strong oxidizers、mineral acids、strong alkalies or halogenated hydrocarbons.

### Section 11. 毒理学资料

#### Toxicological information

标志及症状：无，除非电池破裂。

Signs & symptoms: None, unless battery ruptures.

内部物质暴露的情况下，蒸汽烟雾可能对眼睛和皮肤的刺激性。

In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.

吸入：对肺有刺激性。

Inhalation: Lung irritant.

皮肤接触：对皮肤刺激性。

Skin contact: Skin irritant.

眼睛接触：对眼睛有刺激性。

Eye contact: Eye irritant

食入：吞下中毒。

Ingestion: Poisoning if swallowed..

下列情况下健康状况会恶化：万一发生与电池内部材料接触的事故，轻微或严重的刺激，都可能使皮肤出现干燥和灼烧的感觉，并且损坏靶器官（肝脏，肾脏）的神经。

Medical conditions generally aggravated by exposure: In the event of exposure to internal contents, moderate to server irritation, burning and dryness of the skin may occur, Target organs nerves, liver and kidneys.

### Section 12. 生态学资料

#### Ecological information

正常使用时，电芯/电池不会有生态和环境方面的影响。

There is no influence to ecology and environment when used properly.

### Section 13. 废弃处置

#### Disposal consideration





废弃电芯不能直接当作普通垃圾处理，用塑料袋装好密封放入回收电池的垃圾桶或当作特殊垃圾处理。废弃电芯不能丢进火中和置于高温环境，不要拆卸，同时不能刺穿和挤压等等。电芯的包装纸盒和塑料盒可作为普通垃圾处理。

Deserted batteries couldn't be treated as ordinary trash. Be put to garbage box which recycle batteries after being placed into plastic bags or be dealt as special trash. Couldn't be thrown into fire or placed in high temperature. Couldn't be dissected, pierced, crushed or treated similarly. The package and plastic box which contain batteries could be treated as ordinary trash. Best way is recycling.

## Section 14. 运输信息

### Transport information

电芯和电池遵从美国的有害物质管理规定，依据特殊规定 188 的 IMDG 规则。所有电芯和电池经测试都能通过美国测试标准手册的第三部分 38.3 章测试规范。

Lithium cells and batteries are subject to the requirements of the U.S. hazardous materials regulations pursuant to 49 CFR 173.185(b), and IMDG Code pursuant to Special Provision 188. Each cell or battery has been tested under provisions of the UN Manual of Tests and Criteria, Part III, Sub section 38.3.

电芯/电池符合 UN38.3 (《联合国建议书》第三部分第 38.3 条)、IATA-DGR 包装规范中 PI965 或者 PI966 或者 PI967 的要求，并且确定在运输时符合相关的规定而不受限制。

Lithium cells and batteries are subject to the requirements of UN38.3 (UN Manual of Tests and Criteria, Part III, subsection 38.3), PI965 TO PI967 of IATA DGR, and transported in accordance with applicable regulations and not restricted.

运输电池时，电池必须经过打包，且有措施（例如将裸露的极耳进行绝缘）防止由于产热而演变的危险并短路防护。

Batteries must be packaged and offered for transportation in a manner that prevents the dangerous evolution of heat (for example, by the effective insulation of exposed terminals) and protects against short circuits.

## Section 15. 法规信息

### Regulation information

法律信息

Law information

《危险物品规则》

《Dangerous Goods Regulations》

《对危险货物运输的有关规定的建议》

《Recommendations on the Transport of Dangerous Goods Model Regulations》

《国际海运危险货物规则》

《International Maritime Dangerous Goods》

《危险品安全运输技术指令》

《Technical Instructions for the Safe Transport of Dangerous Goods》

《危险货物分类和品名编号》

《Classification and code of dangerous goods》

《职业安全卫生法》

《Occupational Safety and Health Act》(OSHA)

《有毒物质控制法》



《Toxic Substance Control Act》(TSCA)  
《消费产品安全法》  
《Consumer Product Safety Act》(CPSA)  
《联邦环境污染控制法》  
《Federal Environmental Pollution Control Act》(FEPCA)  
《石油污染法案》  
《The Oil Pollution Act》(OPA)  
《超级基金修正案和再授权法案III(302/311/312/313)》  
《Superfund Amendments and Reauthorization Act TitleIII (302/311/312/313)》(SARA)  
《资源保护及恢复法案》  
《Resource Conservation and Recovery Act》(RCRA)  
《安全饮用水法》  
《Safety Drinking Water Act》(CWA)  
《加州 65 提案》  
《California Proposition 65》  
《美国联邦法规》  
《Code of Federal Regulations》(CFR)  
根据所有联邦、州和地方法律。  
In accordance with all Federal, State and local laws.

#### Section 16. 其他信息

##### Other information

本 MSDS 中的信息不对翠鸟新能源科技（南通）有限公司生产的所有电池有效。本文信息来源可靠，但我们不保证来源描述的完整性、精确性等。使用者须掌握正确使用电芯的方法并对电芯的使用负责，我们对由于电池的滥用而造成的伤害和损失不承担责任。

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Note: “\*in the report indicates that it is not included in the scope of CNAS, “§” indicates that it is not included in the CMA scope of ICAS.

2. “#”号代表数据来源于指定的签约实验室

“#” indicated that data comes from designated contracted lab:

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